

NEW ZEALAND MARINE DEPARTMENT

TECHNICAL FISHERIES REPORT

NO.14

CRAYFISH POT ESCAPEMENT GAP SURVEY

NOVEMBER 1965 - JANUARY 1966

L.D. RITCHIE

WELLINGTON, NEW ZEALAND, 1966

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Introduction

Crayfish around New Zealand coasts have been declining in numbers owing to commercial exploitation.

Conservation of crayfish is possible by the use of escape gaps in crayfish pots. Escape gaps are not in regular use in New Zealand waters, and several experiments have therefore been conducted to determine the extent of the liberation of young crayfish before the pots are brought to the surface. The future economic operation of commercial crayfishing in New Zealand depends on the present conservation of these young crayfish.

This survey was carried out, using commercial crayfishing boats at four important crayfishing areas:- Gisborne, Napier, Wellington, and Bluff, during the summer of 1965-66.

Acknowledgements

I would like to thank J. and R. Phear, and Messrs Barnao and Gerver of Gisborne; Mr Trow of Napier, the Greco Bros of Wellington and Messrs Hansen and Dickson of Bluff, for their cooperation and interesting discussions.

I would also like to thank Dr R.B. Pike and Mr R.J. Street for permitting me to peruse unpublished data on crayfish escape-ment.

Direction of the project and reviewing of the test by Mr B.R. Tunbridge are gratefully acknowledged.

Definitions of Terms used Throughout this Report

Escape Gap - A hole of critical vertical dimension, which allows entrance and exit of undersize crayfish, but which prevents the escape of legal sized crayfish.

Escape Pot - A pot with an escape gap.

Total Length of Crayfish - The length from the anterior tip of the "horn", or medial rostral spine, to the posterior edge of the telson, or middle tail flipper.

Legal Sized Crayfish - Crayfish of a minimum total length of ten inches.

Under Sized Crayfish - Crayfish of less than ten inches in total length.

Potnight - A twenty-four hour period during which a crayfish pot is fishing, or "set".

Fishing Areas

Commercial crayfish pots and experimental escape pots were fished in the following areas:-

Gisborne:

From Tatapouri, north to Gable End Foreland, a distance of twelve miles, (Fig.1) between the 12th and 22nd December 1965.

Napier:

A three mile stretch of coast to the south of Kairakau Beach, lying approximately forty miles south of Napier, (Fig.1) from the 2nd to the 7th December 1965.

Wellington:

A two and a half mile stretch of coast from Island Bay to Moa Point, (Fig.1) between the 17th and 26th November 1965.

Bluff:

From Centre Island to Pahia Point, a distance of twelve miles, and at Pahia Point, (Figs 2 and 3), between the 15th and 24th January 1966.

Commercial Crayfish Pots

Gisborne -

The most commonly used pots are square with wood or steel frames. They measure 4 by 3 feet with a depth of 18 inches. The neck is 12 by 12 inches with a depth of 4 inches and is constructed either of wood or of wire netting in the wooden frame pots.

The pots are covered with either $1\frac{1}{2}$ inch wire netting or 2 inch cyclone netting and have no door.

The wooden framed pots fish well and are commonly used, although they are heavy, weighing up to 120 lbs dry and are also attacked by shipworm Teredo antarctica.

Steel mesh pots are becoming widely used in both Gisborne and Napier. They measure 4 by 3 feet with a depth of 18 inches, and have a solid wooden throat 12 inches wide and 4 inches deep. They are constructed from one sheet of 6 by 2 inch mesh steel which is bent up and around to form the sides and the top and bottom. The ends are formed by bending cut mesh bars around the edges of the main body of the pot. They have no door, (Fig.4).

The internal measurement of each mesh is $5\frac{3}{4}$ by $1\frac{1}{4}$ inches and this allows the escape of crayfish under 8 inches.

These pots are very strongly constructed and weigh between 50 and 60 lbs each. They require less maintenance than the netting covered wooden framed pots.

Round supplejack pots are still in use at Gisborne and recently round wire mesh pots have been tried.

NORTH ISLAND-NEW ZEALAND

LOCATION MAP showing areas of
CRAYFISH POT ESCAPE GAP SURVEY

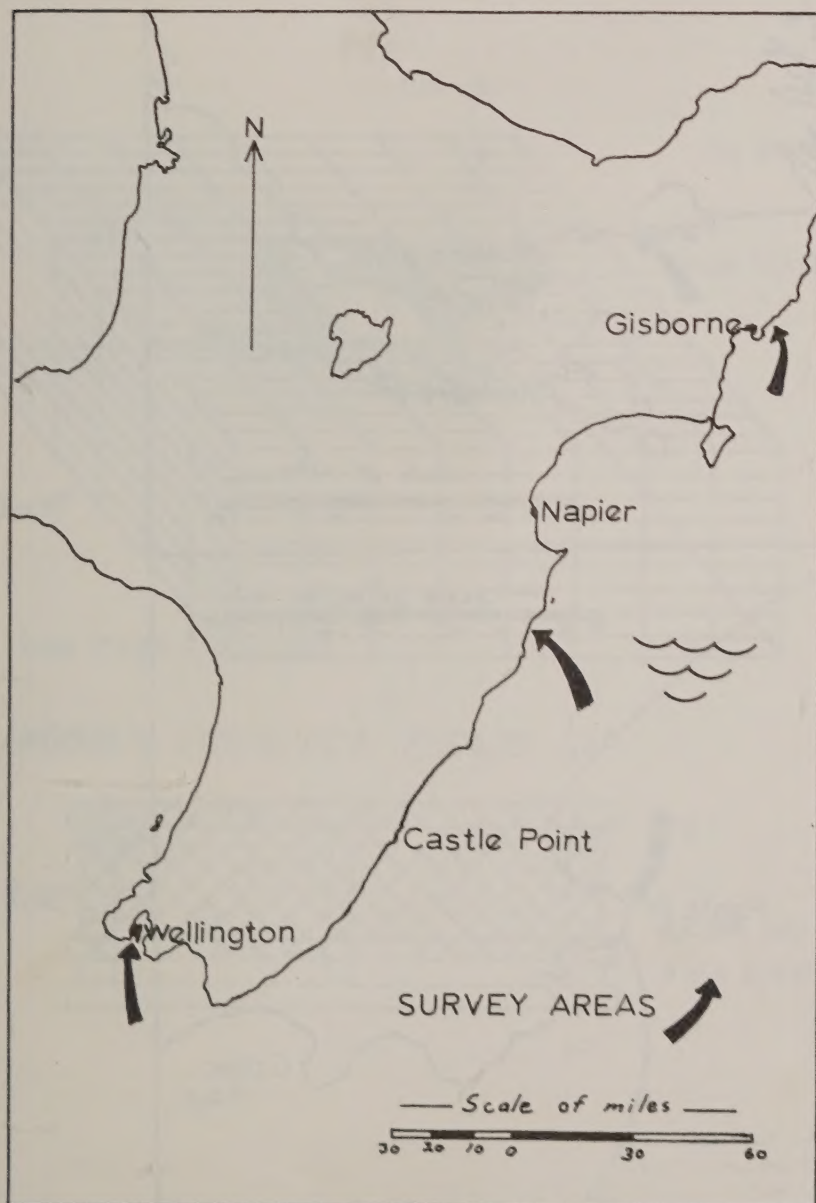
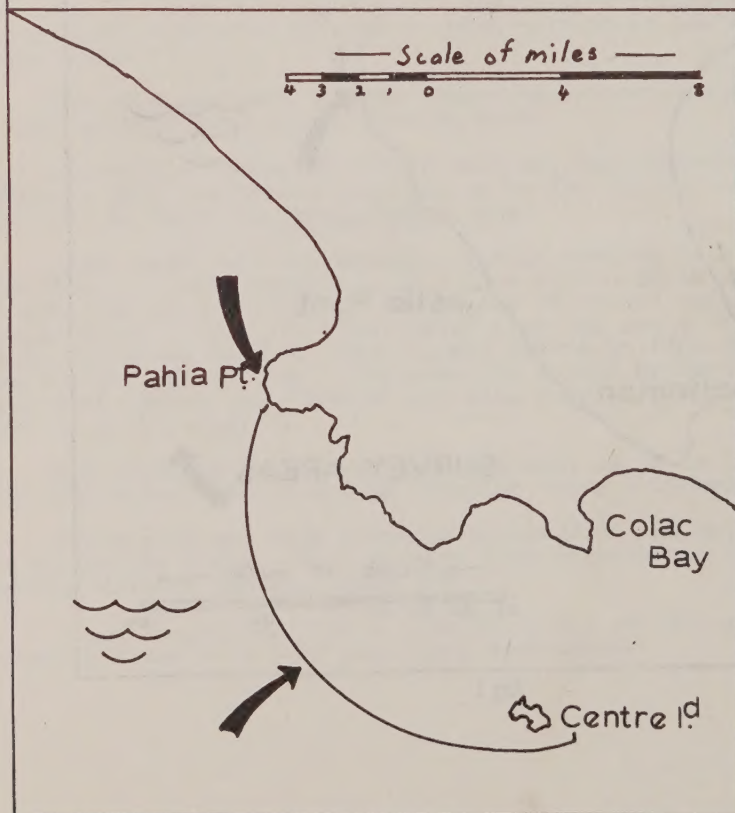
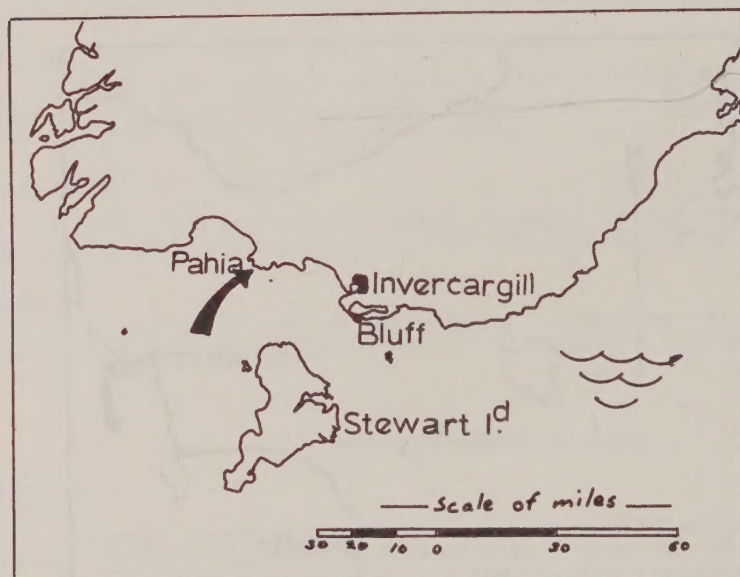


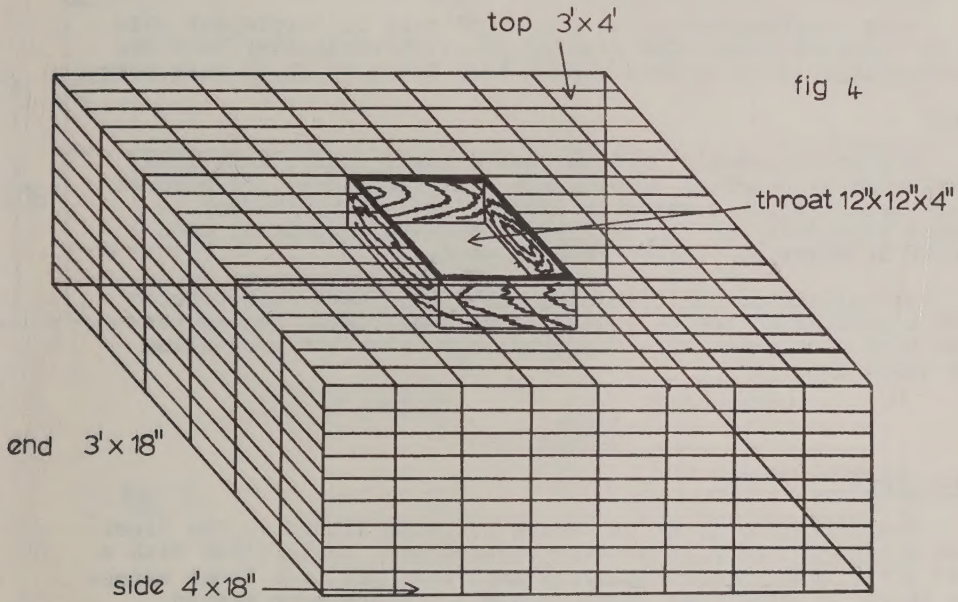
fig 1

SOUTH COAST - SOUTH ISLAND

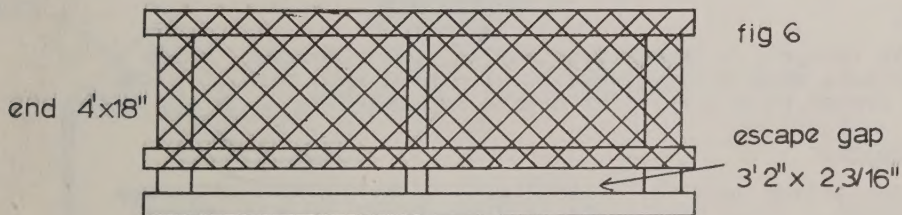
LOCATION MAP showing areas of
CRAYFISH POT ESCAPE GAP SURVEY



STEEL 6" x 2" MESH POT



WOODEN FRAME POT ESCAPE GAP



Napier -

Two main pot types, similar to those at Gisborne, are used at Napier.

These are the square steel framed pots covered with wire netting and the square steel 6 by 2 inch mesh pots previously described.

The latter type of pot is used at Napier to a greater extent than at any other crayfishing port in New Zealand.

Wellington -

Island Bay fishermen predominantly use round pots, the smaller ones made of supplejack, the larger of cane.

Many crayfishermen consider round cane or supplejack pots to be the most successful fishing pots; however they have the disadvantage in being less robust than frame or steel mesh pots.

Bluff -

The most commonly used pot has a steel frame, sometimes reinforced by diagonal cross members at the sides, and covered by 2" mesh cyclone netting (Fig.5). One end of the pot is hinged as a door and the neck is a separate structure, made either of sheet galvanised iron or wood.

At Wellington and Gisborne, frame pots have been covered with a plastic coated cyclone type mesh netting. These pots have been disappointing - the resultant catch not warranting the extra expense.

Escape PotsGisborne -

Two different types of escape pot were fished. The first were wooden framed wire netting covered pots each filled with a 2 to $2\frac{3}{16}$ inch escape gap along each end, giving a total escape gap length of about six feet, (Fig.6). These were fished together with normal commercial steel 6 by 2 inch mesh pots without escape gaps. Supplejack pots were the second type of pot used. They were fitted with one 16 by $2\frac{3}{16}$ inch escape plate lowed low in the side of the pot, (Fig.7).

Napier -

No escape pots were fished at Napier. However, catch comparisons were made between steel 6 by 2 inch mesh pots and steel framed pots covered with wire netting.

Wellington -

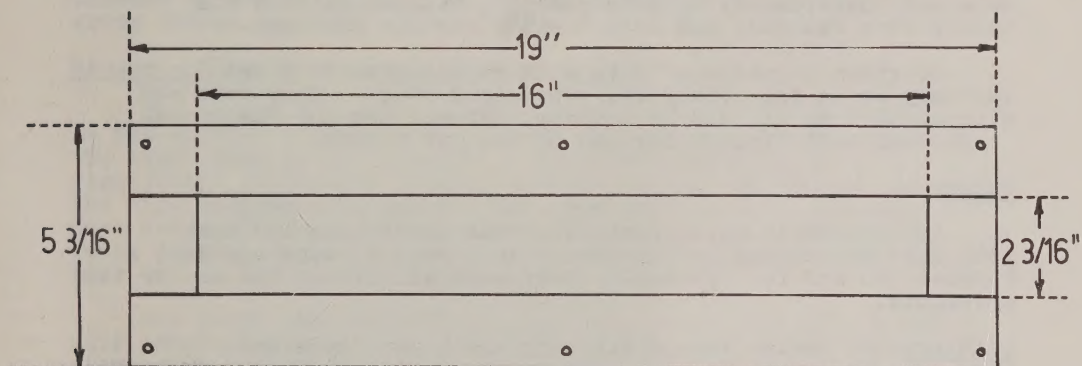
Supplejack pots were fitted with 16 by $2\frac{3}{16}$ inch escape gap plates. They were randomly distributed amongst supplejack pots without escape gaps, and it was then possible to compare the catches from the two types of pot.

Bluff -

Escape pots similar in size and shape to the commercial pots, were constructed by the addition of an extra bar welded across the ends of the pots, $2\frac{3}{16}$ inch up from the bottom bar (Fig.5). The cyclone netting was attached to these additional bars, giving two 3 foot wide by $2\frac{3}{16}$ inch deep escape gaps. These escape pots were fished amongst commercial pots.

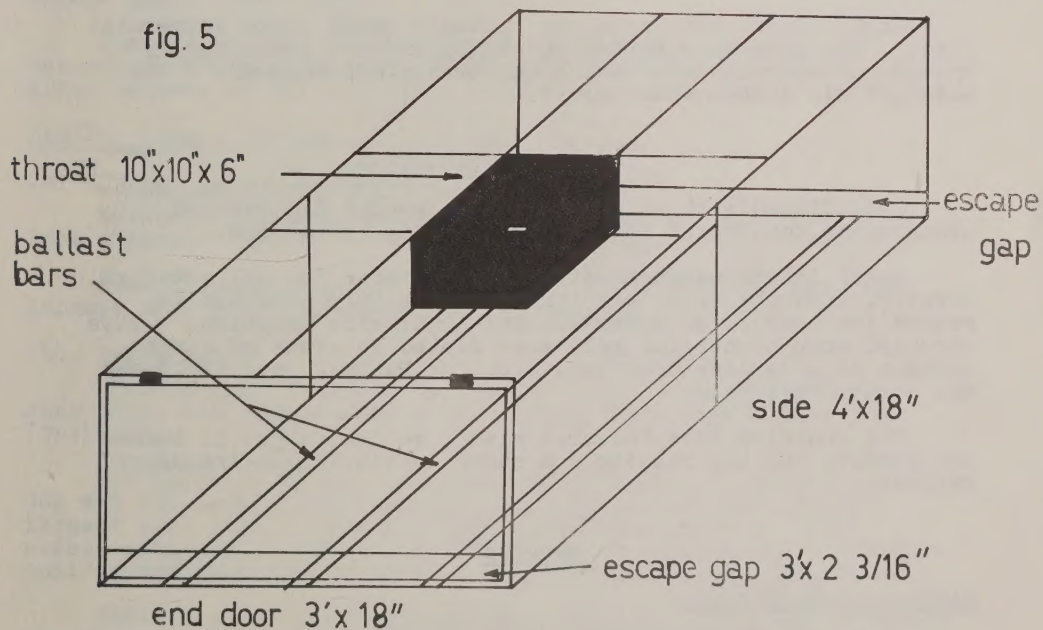
ESCAPE GAP PLATE FOR ROUND SUPPLEJACK POT

fig. 7



STEEL FRAME ESCAPE GAP POT

fig. 5



Escape Pot Fishing Technique

The general technique of crayfishing was similar in the four areas visited. The commercial crayfishing boats were all between thirty and forty five feet in length. All the boats had winches, and fishing times of one potnight were used when possible.

Gisborne -

The wooden framed escape pots and the steel mesh pots were heavily baited with "rubbish" fish and fish skeletons. They were set individually by echo sounder, between fifteen and twenty five fathoms, and left fishing for one potnight.

Fourteen supplejack pots with escape gaps were set randomly among the commercial supplejack pots. They were set without the use of an echo sounder, between two and twelve fathoms, and left fishing for one or two pot nights.

Napier -

Approximately equal numbers of the frame pots and mesh pots were baited and set in groups or lines, by echo sounder, at between two and ten fathoms. They were all fished for one or two potnights.

Wellington - Twelve escape gap supplejack pots were set randomly amongst twenty six commercial supplejack pots. The pots were baited more lightly than at Gisborne or Napier and were set in groups or lines without the use of an echo sounder, in three to twelve fathoms in a heavily fished area.

Bluff -

Eight escape pots were set randomly among forty commercial pots. The pots were baited sparingly and set individually by echo sounder between twelve and twenty two fathoms. One potnight was fished when possible.

Sampling Techniques

Pots fitted with escape gaps were evenly distributed amongst the commercial pots during fishing operations.

Total length measurements were attempted for all crayfish. However, when the catch was large, it was only possible to record the numbers of undersize and legal size crayfish. This occurred when commercial pots were fished in areas of large numbers of undersize crayfish, e.g., at Pahia Point, Bluff and Moa Point, Wellington.

The crayfish were measured with a wooden ruler, in inches and tenths, and the results are shown in the length-frequency graphs.

Results

Gisborne - Supplejack:

There was little difference in the crayfish catch of escape and commercial pots, when the pots were set for only one night, (Table 1). The catch of legal crayfish in both pot types averaged 36%. However, when the pots were left for two nights the escape pot catch of legal crayfish nearly doubled (63%), while the legal catch from commercial pots remained the same as for one potnight catches.

The commercial pots and escape pots fished for one potnight have the largest size group of crayfish below ten inches, while escape pots fished for two potnights have the largest size group, above ten inches, (Fig.8).

Mesh Pots and Netting Pots:

Steel mesh pots liberated slightly more undersize crayfish than did the wire netting escape pots, and had a 15% larger catch of legal crayfish, (Table 1.).

The escape pots had the largest size group of crayfish between $9\frac{1}{2}$ and 10 inches, while mesh pots had the largest size group between 9 and $9\frac{1}{2}$ inches, (Fig.9).

Napier - Wire Netting and Steel Mesh Pots:

The length of time the pot was fishing had little effect on the catches of either the commercial frame netting pots or the steel mesh pots (Table 2). There was, however, a significant difference between the catches of the two pot types. The wire netting pots had a 17.5% legal catch, while the mesh pots had a 39% legal catch. The steel mesh pots also caught fewer crayfish under 8 inches. The largest size group of crayfish was in the $8\frac{1}{2}$ to 9 inch range (Fig.10).

The frame pots without escape gaps, caught 50% more undersize crayfish (down to 6 inches in length) and had the largest size group between $7\frac{1}{2}$ and 8 inches (see discussion).

Wellington - Supplejack Pots:

The escape pots caught 33% more legal sized crayfish and 65% less undersize crayfish, than the catch of pots without escape gaps, (Table 3).

Commercial pots had the largest size group of crayfish between 9 and $9\frac{1}{2}$ inches, while escape pots had the largest size group between $9\frac{1}{2}$ and $10\frac{1}{2}$ inches (Fig.11).

Bluff - Frame, cyclone netting covered pots:

(a) Centre Island to Pahia

Escape pots caught 27% more legal sized crayfish and 50% less undersize crayfish, than did the commercial pots (Table 4).

Both commercial pots and escape pots had catches with the largest size group between 10 and $12\frac{1}{2}$ inches (Fig.12).

(b) Pahia Point

Escape pots increased in the catch of legal crayfish by over 100%, and reduced the catch of undersize crayfish by 93% (Table 4).

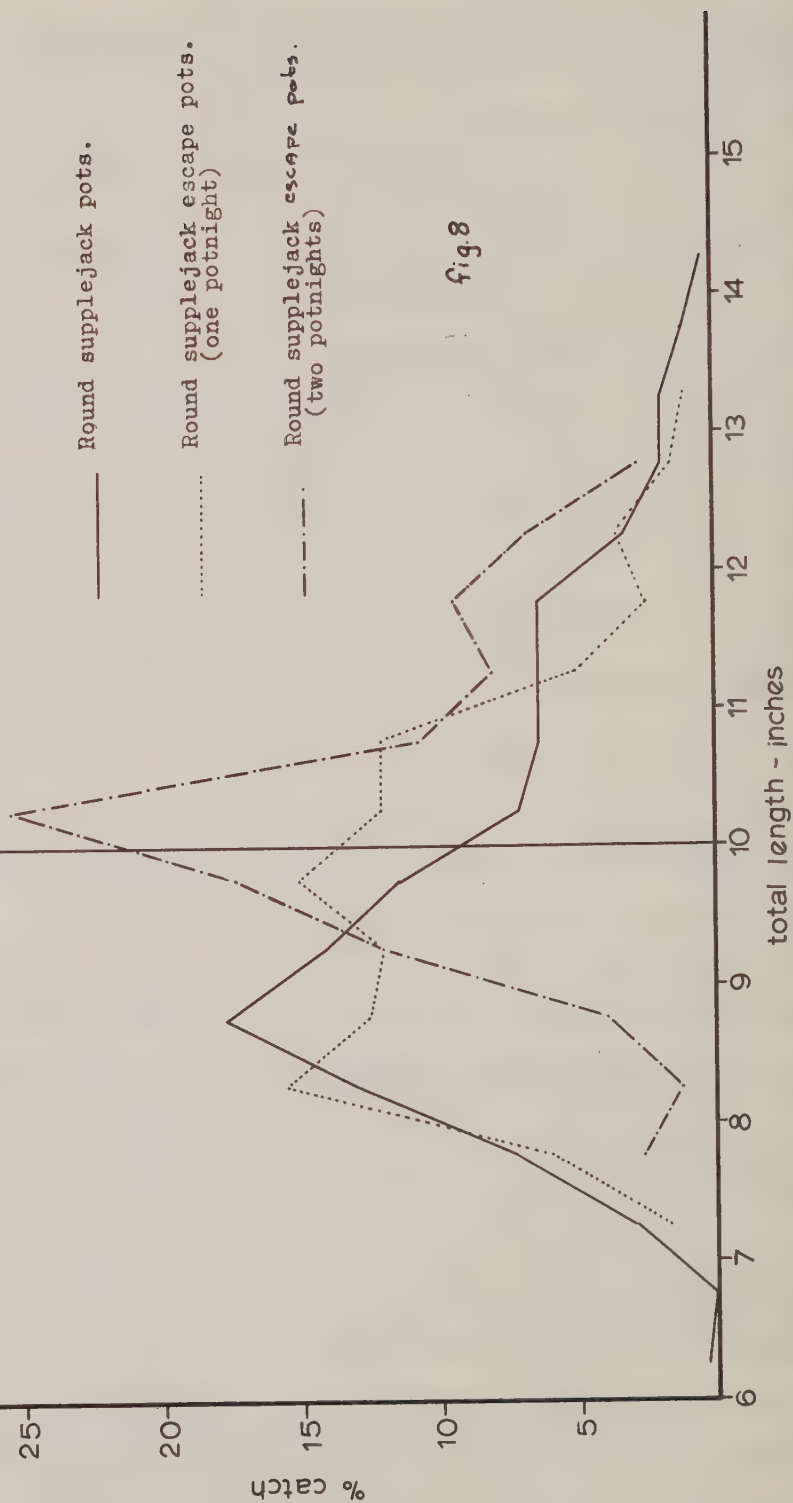
The catch of escape pots had the largest size group between $10\frac{1}{2}$ and $11\frac{1}{2}$ inches while the catch of commercial pots had the largest size group between $8\frac{1}{2}$ and $9\frac{1}{2}$ inches (Fig.13). The escape pots caught larger crayfish i.e. crayfish up to $17\frac{1}{2}$ inches, while commercial pots caught no crayfish larger than $13\frac{1}{2}$ inches.

Table 4 shows that although the size range of crayfish varied greatly between two areas, in favourable fishing conditions, escape pots yielded the same percentage of legal sized crayfish.

GISBORNE AREA

TATAPOURI

GABLE END FORELAND



GISBORNE AREA

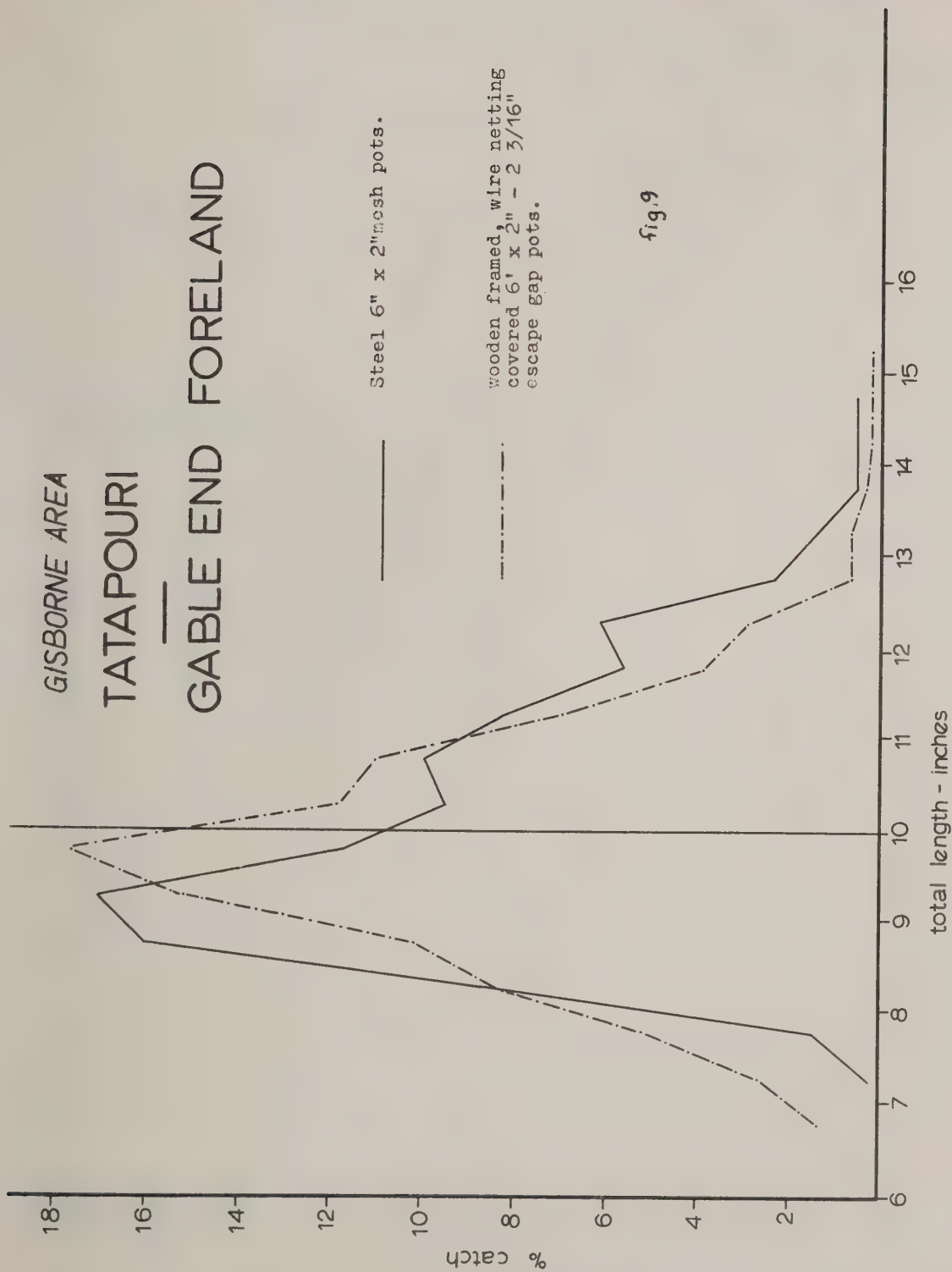
TATAPOURI

GABLE END FORELAND

Steel 6" x 2" mesh pots.

wooden framed, wire netting
covered 6' x 2" - 2 3/16"
escape gap pots.

fig. 9



NAPIER AREA

KAIRAKAU

BROKEN HILLS

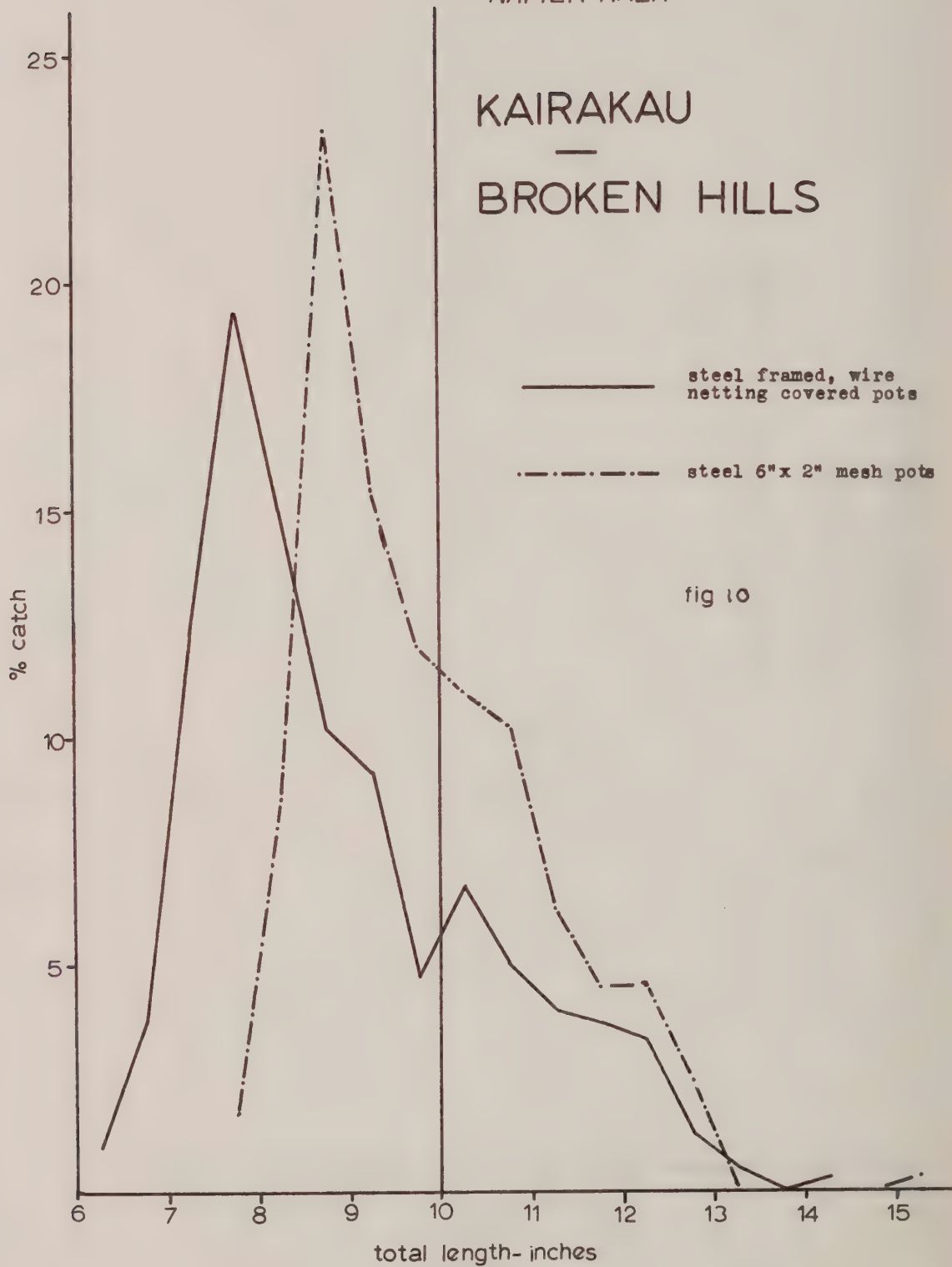


fig 10

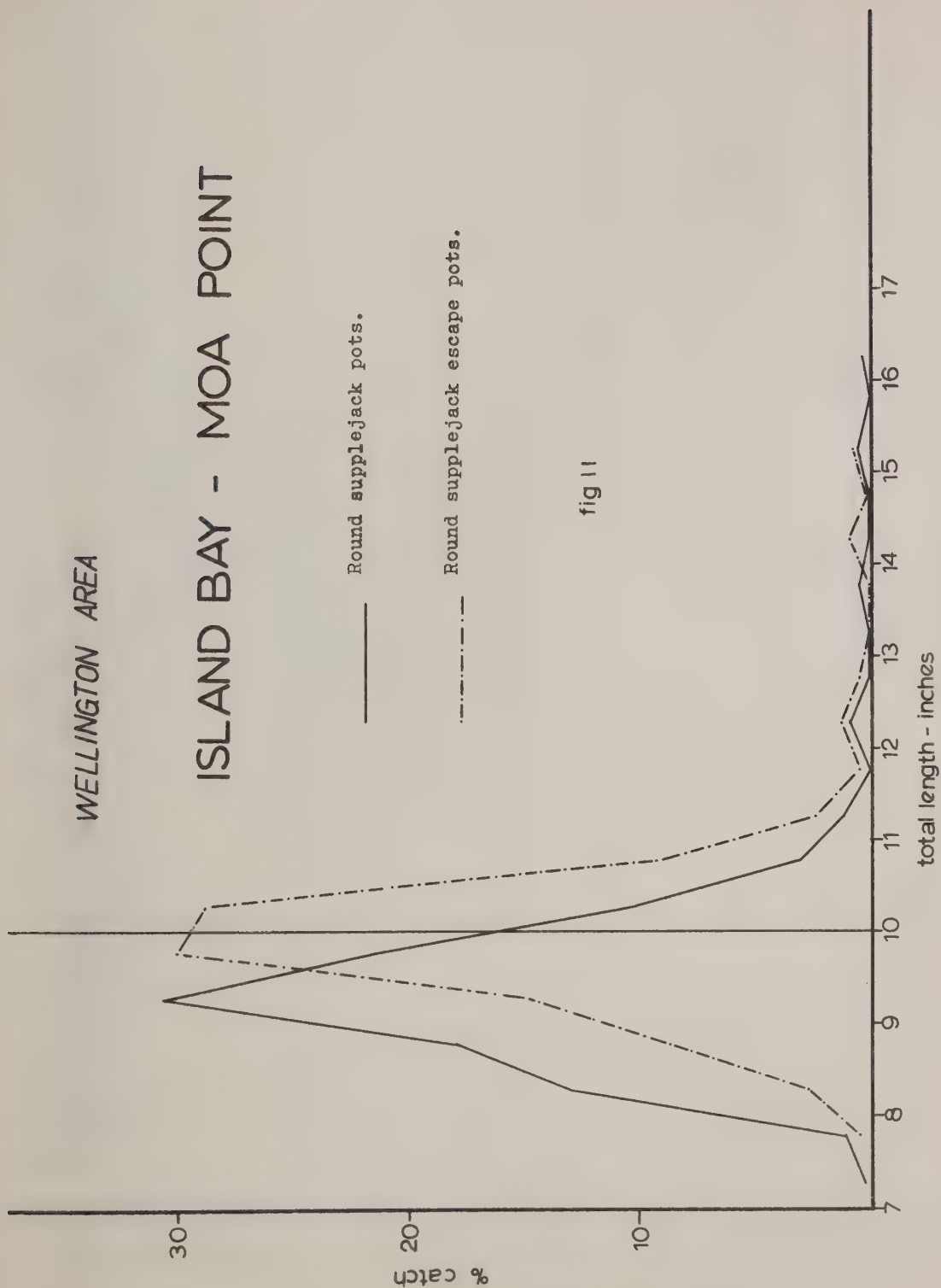
WELLINGTON AREA

ISLAND BAY - MOA POINT

— Round supplejack pots.

- - - Round supplejack escape pots.

fig 11



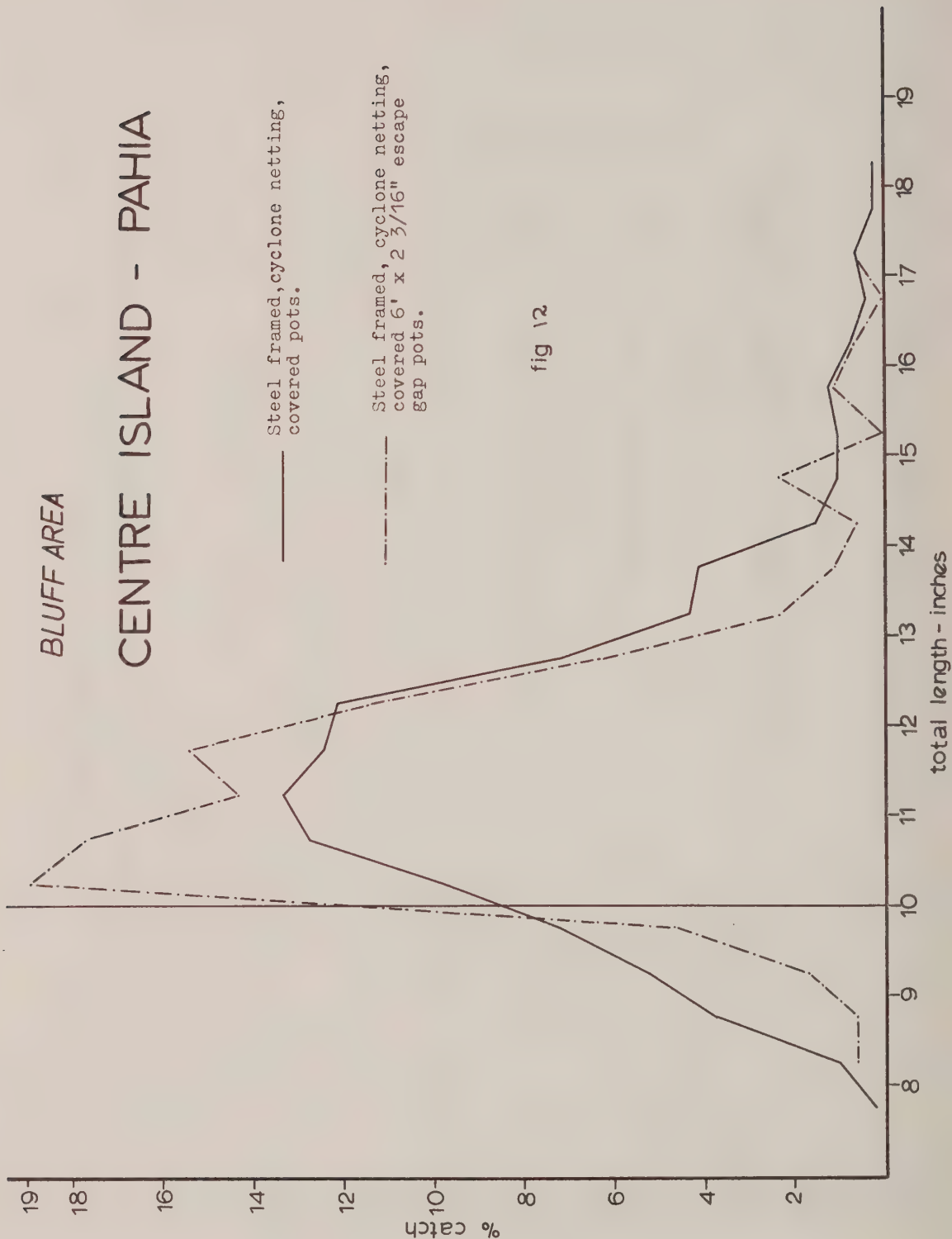
BLUFF AREA

CENTRE ISLAND - PAHIA

Steel framed, cyclone netting,
covered pots.

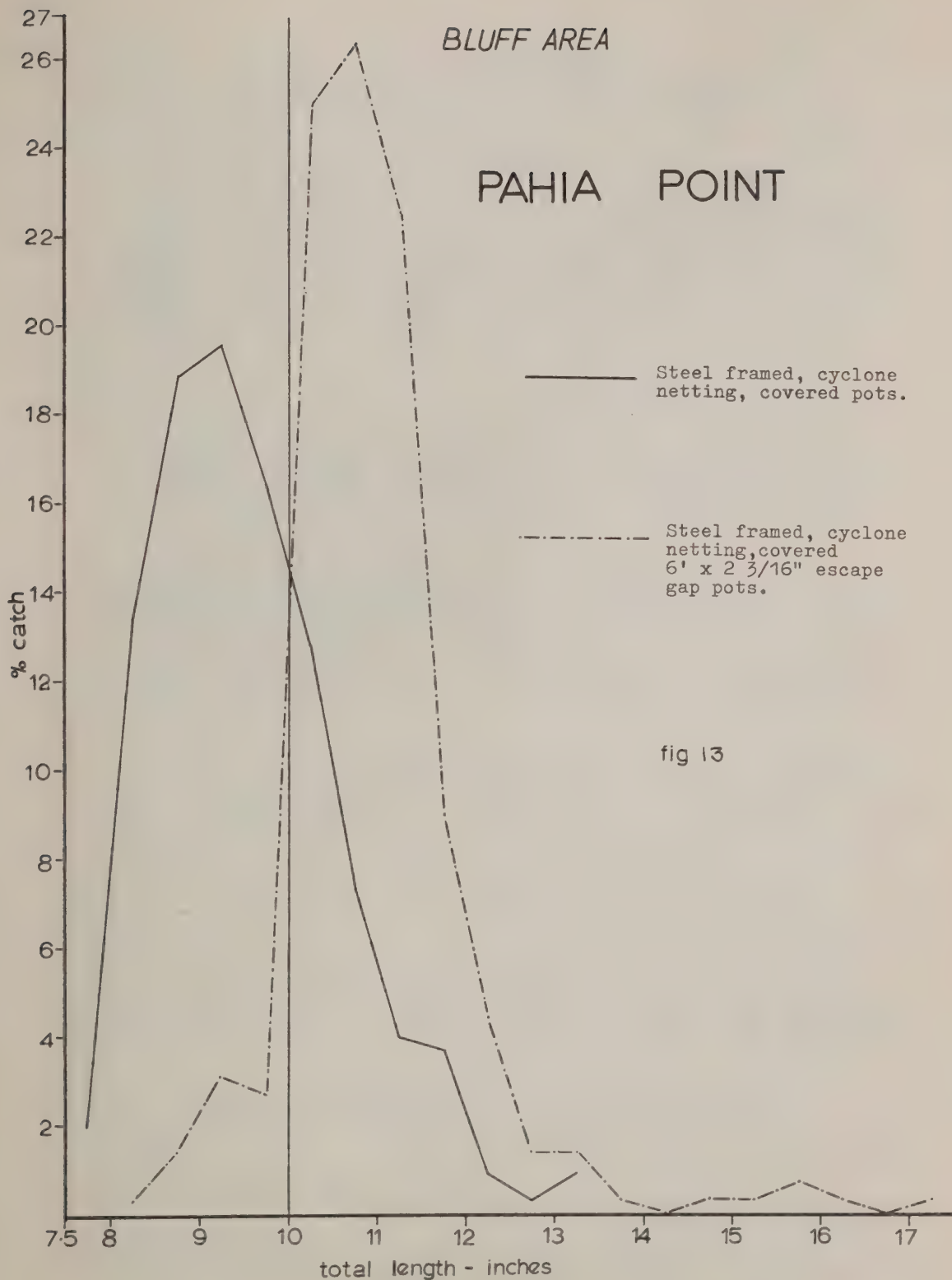
Steel framed, cyclone netting,
covered 6' x 2 3/16" escape
gap pots.

fig 12



BLUFF AREA

PAHIA POINT



Discussion

Bowen, working in Western Australia (1963) and Street, working in Southern New Zealand waters (1964) have outlined the advantages of the use of crayfish pots fitted with escape gaps.

The most important of these is the conservation of crayfish stocks, by permitting undersize crayfish to leave the pots on the sea floor. This reduces mechanical damage during sorting and physiological damage due to the drying effect of wind and sun while crayfish lie on deck awaiting sorting. The use of escape gaps also ensures that undersize crayfish can remain in a suitable and familiar habitat; rather than being carried some distance on the boat and deposited on an exposed sandy bottom; becoming easy prey for such fish as groper, cod and dogfish. Another obvious advantage of the use of escape gaps, is that fishermen save time in sorting the catch.

The Practicability of Escape Gaps

Fishermen have suggested that escape pots fished in areas where small crayfish are numerous, would be ineffective due to the escape gap becoming blocked by undersize crayfish. At no stage of this survey, did blockage of escape gaps occur; even in areas where small crayfish were numerous e.g. Moa Point (Wellington) and Pahia Point (Bluff).

An explanation of why escape gap blockage does not occur is given by Street (Pers. Comm. 1966). "Crayfish piled up on the bottom of a pot may block the escape gap when the pot is lifted aboard. However, underwater observations of pots before hauling, shows that crayfish are positioned on the sides and top as well as on the bottom of the pot. They make their way to the bottom only when the pot is being lifted. Crayfish therefore will not be stopped from escaping even when the level of the catch in a hauled pot is above the gap".

Another criticism of escape gaps is that crayfish tails protruding through the gap would be crushed as the pot is hauled aboard. In the square escape pots used at Gisborne and Bluff, the escape gap was situated at each end of the pot. The pots were hauled so that the side of each pot was dragged against the boat. This kept the escape gaps clear of the side of the boat and prevented the crushing of any protruding tails.

Tails can be crushed in normal pots if they are caught between a bottom bar of a frame pot and the netting, if the netting is slack due to age.

Crushing of tails protruding through the escape gap of round supplejack pots need never occur, as the recommended escape gap length is only sixteen inches, and the gap can be swung away from the side of the boat as the pot is lifted clear of the water.

Street (Pers. Comm. 1966) implies that crayfish are more or less evenly distributed on the sides and top and bottom of a set crayfish pot, and that escape of undersize crayfish occurs while the pot is on the bottom.

Bowen (1963) also states, "It seems that few, (Crayfish), if any, are forced through the gap, while the pot is being hauled to the surface."

These statements are true for the Southern crayfishing areas of New Zealand. However, it was observed that, at Gisborne and Napier undersize crayfish escaped when the pot was near the

surface, especially from pots with bait remaining. There had obviously been no incentive for the undersize crayfish to leave the pot; the pot giving both food and shelter to the small crayfish.

Effect of Variation in Escape Gap Size

At Gisborne and Napier it appears that the length and thus total area of the escape gap determines the escape of small crayfish. This is well demonstrated by steel 6 by 2 inch mesh pots fished in these areas. These pots allowed the escape of all crayfish under 8 inches, whereas the wire netting pots fished in the same area catch crayfish as small as 6 inches (Fig.6). Crayfish less than 8 inches in length fall through the lower sides and bottom of the mesh pots, on hauling.

At Gisborne, square steel mesh pots caught more legal crayfish, 41 per 10 potnights, than did the square wire netting escape gap pots, 35 per 10 potnights. Conversely, more undersize crayfish escaped from the mesh pots than did from the escape gap pots.

This is apparently an anomaly, however, even though escape gap pots have a larger vertical dimension for escape (2 - 23/16 inch) than do the mesh pots (1 1/2 inch), the total area of escape gap in the escape gap pot, is much less than it is in the mesh pots.

From this evidence, it appears that the best form of escape gap pot, for areas where small crayfish are abundant, and where bait remains in a pot for a long period such as at Gisborne and Napier, would be a steel mesh pot constructed of larger mesh.

Mesh pots could be made from 9 by 27/16 inch steel mesh giving an internal escape gap size of each mesh of 8 1/2 by 23/16 inches.

Steel companies make the mesh sheets to order, by welding 1/4 inch steel rod in cross patch fashion.

If this form of pot gained wide acceptance, 9 by 27/16 inch mesh would be as readily available and as cheap as the existing 6 by 2 inch mesh.

The mesh pots do not appear to become distorted with use until after about two or three seasons, by which time they are usually discarded.

Conditions Affecting the Escape of Small Crayfish

Tests carried out at Gisborne with escape pots set for one potnight were unsatisfactory and inconclusive, and escape pots generally contained only slightly fewer undersize crayfish than did commercial pots.

Bowen (1963) states, "It is evident that crayfish seek an escape route after feeding."

Street (Pers. comm. 1966) suggests that the success of escape pots depends on whether crayfish want to use a pot as a daytime shelter.

Crayfish pots appear to be too heavily baited for single potnight fishing in both Gisborne and Napier. Crayfish did not escape during a twenty four hour period, as there was an abundance of feed, and the pot itself formed a temporary shelter.

Street (Pers. comm. 1966) stated that small crayfish will enter a baited pot first; later, larger crayfish will tend to drive out the smaller individuals. If this is so, then the escape pots should catch more of the larger crayfish than commercial pots, due to the increased ease of escape for the smaller crayfish. This has been proved true on the Colac-Pahia coast, (Bluff) where large crayfish are caught. At Gisborne, between Tatapouri and Gable End Foreland, the coast has been heavily fished and few large crayfish remain. The small crayfish are therefore under no pressure to leave the pots, due to either lack of food or the presence of large crayfish. Evidence for this is shown by the catch from nine supplejack escape pots fished for one and two potnights. The bait was gone and the effectiveness of the escape pots was doubled, in those pots left for the longer period.

At Wellington, even though the survey was carried out in a very heavily fished area, the escape pots proved worthwhile, in that they increased the catch of legal crayfish and decreased the catch of undersize crayfish. Crayfish pots used during the survey at Wellington were not baited as heavily as those at Gisborne and Napier, and the bait appeared to be eaten much more readily at Wellington. This is probably due to the increased numbers of sea lice Livoneca novae zelandiae present in the colder southern waters.

It is difficult to draw satisfactory conclusions concerning the effect of different potnight periods, on the catch at Napier. Possibly the presence of large numbers of octopus influenced the results. In one two day period, one pot in eight contained an octopus.

Increase in the Catch of Legal Crayfish

Between Centre Island and Pahia Point the escape gaps were very effective, in that they increased the catch of legal crayfish by a third and reduced the number of undersize crayfish. However, few undersize crayfish were caught in any of the pots as the area is one of comparatively large crayfish. Escape gap pots will substantially increase the legal catch, in such an area, particularly if the pots are lightly baited.

Large numbers of small crayfish occur at Pahia Point. Escape pots set in this area proved the most effective of the entire survey.

The undersized crayfish leave the pot while it is still on the bottom. The light baiting of the pot and the numbers of sea lice ensured that little bait was left to keep the small crayfish in the pot. The large number of legal sized crayfish also helped to drive the undersized crayfish from the pot.

The escape pots used at Bluff were not only effective but acceptable to the fishermen. They were sound in design and only slightly more expensive to modify.

Conclusion

Crayfish pots fitted with escape gaps are effective, especially in areas where small crayfish are numerous e.g., Moa Point (Wellington) and Pahia Point (Bluff).

Escape pot effectiveness depends on five factors:-

- (1) The total escape gap area.
- (2) The amount of bait used.
- (3) The time taken for the bait to be consumed.
- (4) The length of time the pot is set.
- (5) The size composition of the crayfish population being fished.

The practical side of escape gap acceptance by fishermen is important. Escape gap effectiveness should be demonstrated to fishermen, by further escape gap survey work, in different localities, and at different seasons of the year.

The incorporation of escape gaps into crayfish pots should neither allow the escape of any legal sized crayfish, or weaken the pot in any way. It is also important that the additional cost of manufacture is kept to a minimum.

Fishermen should be encouraged by education to use escape pots, rather than by enforced regulations.

References

- BOWEN, B.K., 1963: Preliminary Report on the Effectiveness of Escape Gaps in Crayfish Pots. (Western Australia Fisheries Department Bulletin).

	GISBORNE AREA.		DEC. 1965. TURIHAUA REEF -		GABLE END FORELAND		TABLE 1.	
POT TYPE	Round Supplejack Pots.		Round Supplejack pots with a 16" x 2 3/16" escape gap		Round Supplejack pots with a 16" x 2 3/16" escape gap	Steel Mesh pots Mesh Size 6" x 1 1/4"	Square Wire netting covered pots 2" - 2 3/16" escape gaps along ends	
TOTAL NO. OF POTNIGHTS	45		23		9	48	69	
LENGTH OF POTNIGHTS	48 hrs.		24 hrs.		48 hrs.	24 hrs.	24 hrs.	
Size Groups - 1/2 inches	No.	%	No.	%	No.	%	No.	%
15 - 15.4	1	0.3	2	1	2	.5	1	.2
14.5 - 14.9	4	1.0	3	1.5	5	.5	1	.2
14 - 14.4	7	1.8	7	3.5	2	.5	1	.2
13.5 - 13.9	7	1.8	5	2.5	6	1.4	2	.3
13 - 13.4	12	3.2	10	5.0	10	2.3	4	.6
12.5 - 12.9	24	6.3	24	12.0	27	6.1	18	2.9
12 - 12.4	24	6.3	24	12.0	25	5.6	24	3.9
11.5 - 11.9	24	6.3	30	15.0	36	8.1	43	6.9
11 - 11.4	27	7.1	24	12.0	44	9.9	68	11.0
10.5 - 10.9	43	11.3	30	15.0	42	9.5	73	11.8
10 - 10.4	54	14.1	24	12.0	52	11.7	119	17.6
9.5 - 9.9	67	17.6	24	12.0	80	17.0	94	15.1
9 - 9.4	49	12.8	25	12.5	71	16.0	63	10.1
8.5 - 8.9	27	7.1	31	15.5	38	8.6	52	8.4
8 - 8.4	11	2.9	12	6.0	6	1.4	31	5.0
7.5 - 7.9	0	0.0	3	1.5	1	.2	16	2.6
7 - 7.4	1	0.3					8	1.3
6.5 - 6.9								
6 - 6.4								
TOTAL	382		200		75	444	621	
NO. LEGAL CRAYFISH	130		75		47	196	239	
& % LEGAL CRAYFISH	34		37.5		62.7	44.1	38.5	
NO. LEGAL CRAYFISH								
PER 10 POTNIGHTS	29		31		52	41	35	

TABLE 2.

WELLINGTON NOVEMBER 1965		ISLAND BAY - MOA POINT.	
POT TYPE	Round Supplejack Baskets	Round Supplejack escape basket Gap = 16" x 2 3/16"	
TOTAL NO. OF POTNIGHTS	57	54	
SIZE GROUPS - HALF INCHES	NO.	%	NO.
16	1	0.2	
15.5	0	0	
15	2	0.4	1
14.5	0		0.4
14	0		
13.5	0		
13	2	0.4	2
12.5	0		0.8
12	0		
11.5	4	0.8	1
11	0		0.4
10.5	6	1.1	1.2
10	16	3.0	0.4
9.5	53	10.1	2.3
9	113	21.5	9.3
8.5	161	30.6	28.8
8	95	18.0	30.0
7.5	68	12.9	14.8
7	5	1.0	8.6
6.5	1	0.2	2.7
			0.4
TOTAL NO. OF CRAYFISH	527		257
NO. OF LEGAL CRAYFISH	84		112
% OF LEGAL CRAYFISH	16		43.6
NO. OF LEGAL CRAYFISH FOR 10 POTNIGHTS.	15		21

BLUFF - SOUTH COAST AREA, JANUARY 1966.

TABLE 4.

POT TYPE	Square, steel frames 1½" cyclone netting, door.	Square escape pots 2 3/16" gap at bottom of each end	Square, steel frames 1½" cyclone netting, door.	Square escape Pots. 2 3/16" gap at bottom of each end.	
LOCALITY	EAST OF PAHIA	EAST OF PAHIA	PAHIA POINT	PAHIA POINT	
Total No. of Potnights	102	23	24	30	
Size Groups - In half inches	No.	%	No.	%	
18	1	.2		1	0.3
17.5	1	.2		0	0.0
17	4	.6		1	0.3
16.5	3	.4		2	0.7
16	5	.7		1	0.3
15.5	8	1.2		1	0.3
15	7	1.0		1	0.3
14.5	7	1.0		0	0.0
14	10	1.5		1	0.3
13.5	28	4.1		4	1.4
13	29	4.3		4	1.4
12.5	49	7.2		13	4.5
12	82	12.1		26	9.0
11.5	84	12.4		66	22.6
11	90	13.3		77	26.4
10.5	86	12.7		73	25.0
10	66	9.8		8	2.7
9.5	49	7.2		9	3.1
9	35	5.2		4	1.4
8.5	25	3.7		1	.3
8	7	1.0			
7.5	1	.2			
TOTAL NO. OF CRAYFISH	677	175	352	292	
NO. OF LEGAL CRAYFISH	560	162	105	270	
% OF LEGAL CRAYFISH	82.7	92.6	29.8	92.5	
NO. OF LEGAL CRAYFISH PER 10 POTNIGHTS	55	70	44	90	

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